

PT5100

Series

1 AMP POSITIVE STEP-DOWN
INTEGRATED SWITCHING REGULATOR

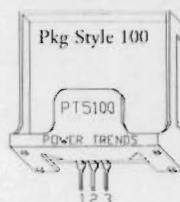
- 85% Efficiency
- Internal Short-Circuit Protection
- Pin-Compatible with 3-Terminal Linear Regulators
- Laser-Trimmed Output Voltage
- Over-Temperature Protection
- Small Footprint
- Wide Input Range

The PT5100 Series is Power Trends' line of economical, easy-to-

use, 1 Amp positive step-down, 3-terminal Integrated Switching Regulators (ISRs) designed for pin compatibility with linear regulators. These ISRs can be used in a wide variety of on-board power regulation applications including computer, data storage, industrial controls, medical, and battery powered equipment. The series of ISRs has excellent line and load regulation and laser-trimmed output voltage.

Pin-Out Information

Pin	Function
1	V _{in}
2	GND
3	V _{out}



Ordering Information

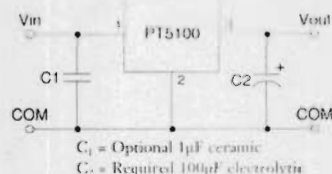
PT5101□ = + 5 Volts
 PT5102□ = + 12 Volts
 PT5103□ = + 3.3 Volts
 PT5105□ = + 6.5 Volts
 PT5107□ = + 15 Volts
 PT5109□ = + 5.6 Volts
 PT5110□ = + 9 Volts
 PT5111□ = + 10 Volts
 PT5112□ = + 8 Volts

PT Series Suffix (PT1234X)

Case/Pin
Configuration

Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

Standard Application



Specifications

Characteristics (T _a = 25°C unless noted)	Symbols	Conditions	PT5100 SERIES			
			Min	Typ	Max	Units
Output Current	I _o	Over V _{in} range	0.1*	—	1.0	A
Short Circuit Current	I _{sc}	V _{in} = V _{in} min	—	3.5	—	A _{pk}
Input Voltage Range	V _{in}	0.1 ≤ I _o ≤ 1.0 A		V _o = 3.3V	9	—
				V _o = 5V	9	—
				V _o = 12V	16	—
				V _o = 15V	19	—
Output Voltage Tolerance	ΔV _o	Over V _{in} Range, I _o = 1.0 A T _a = 0°C to +60°C	—	±1.5	±3.0	% V _o
Line Regulation	Reg _{line}	Over V _{in} range	—	±0.5	±1.0	% V _o
Load Regulation	Reg _{load}	0.1 ≤ I _o ≤ 1.0 A	—	±0.5	±1.0	% V _o
V _o Ripple/Noise	V _n	V _{in} = V _{in} min, I _o = 1.0 A	—	±2	±5	% V _o
Transient Response with C _{in} = 100μF	t _{tr} V _{ris}	25% load change V _o over/undershoot	—	100	200	μSec
			—	3.0	5.0	% V _o
Efficiency	η	V _{in} = 9V, I _o = 0.5A, V _o = 3.3V	—	82	—	%
		V _{in} = 9V, I _o = 0.5A, V _o = 5V	—	85	—	%
		V _{in} = 16V, I _o = 0.5A, V _o = 12V	—	90	—	%
		V _{in} = 19V, I _o = 0.5A, V _o = 15V	—	92	—	%
Switching Frequency	f _o	Over V _{in} and I _o ranges, V _o = 3.3V V _o = >5V	575	725	875	kHz
			500	650	800	
Absolute Maximum Operating Temperature Range	T _a		-20	—	+85	°C
Recommended Operating Temperature Range	T _a	Free Air Convection, V _o = 3.3V	-20	—	+80**	°C
		(40-60L/FM) V _o = 5V	-20	—	+80**	
		At V _{in} = 24V, I _o = 0.75A V _o = 12V	-20	—	+80**	
Thermal Resistance	θ _{ja}	Free Air Convection, V _o = 3.3V	—	45	—	°C/W
		(40-60L/FM) V _o = 5V	—	50	—	
		V _o = 12V/15V	—	60	—	
Storage Temperature	T _s		-40	—	+125	°C
Mechanical Shock		Per Mil-STD-883D, Method 2002.3 1 msec, Half Sine, mounted to a fixture	—	500	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2 20-2000 Hz, Soldered in a PC board	—	5	—	G's
Weight			—	4.5	—	grams

* ISR will operate down to no load with reduced specifications.

**See Thermal Derating chart.

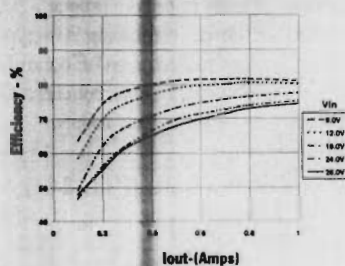
Note: The PT5100 Series requires a 100μF electrolytic or tantalum output capacitor for proper operation in all applications.

PT5100 Series

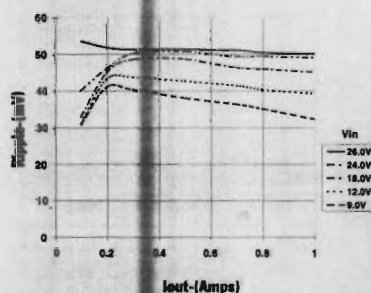
CHARACTERISTIC DATA

PT5103, 3.3 VDC (See Note 1)

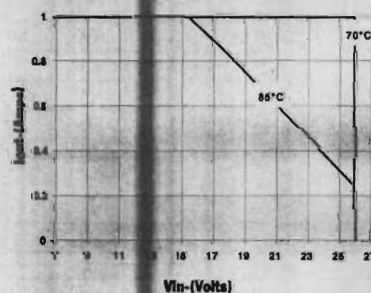
Efficiency vs Output Current



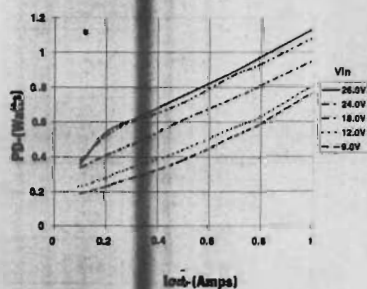
Ripple vs Output Current



Thermal Derating (T_A) (See Note 2)

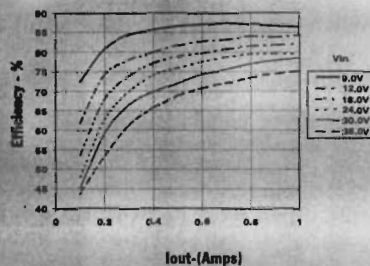


Power Dissipation vs Output Current

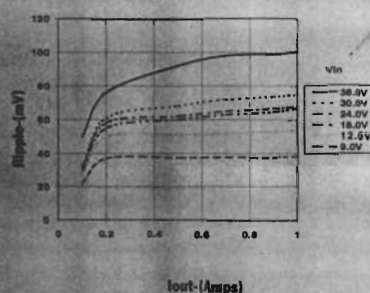


PT5101, 5.0 VDC (See Note 1)

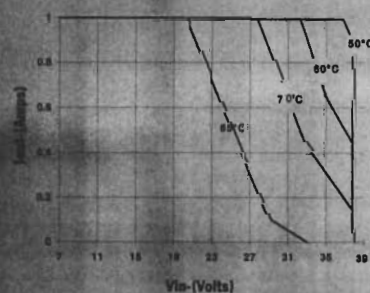
Efficiency vs Output Current



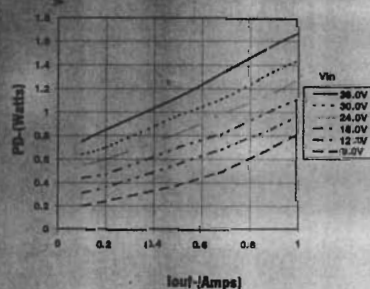
Ripple vs Output Current



Thermal Derating (T_A) (See Note 2)

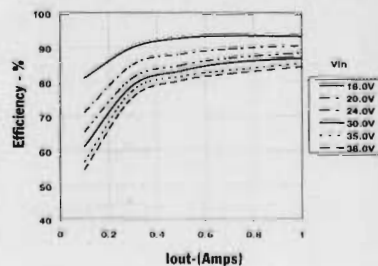


Power Dissipation vs Output Current

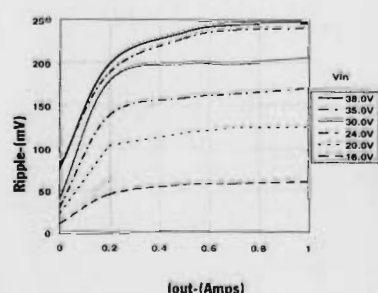


PT5102, 12.0 VDC (See Note 1)

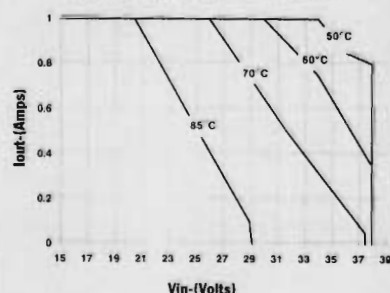
Efficiency vs Output Current



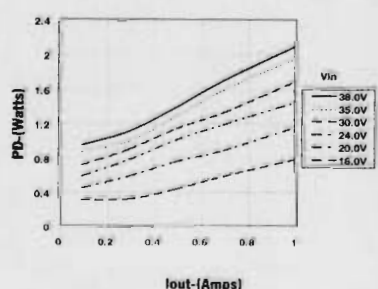
Ripple vs Output Current



Thermal Derating (T_A) (See Note 2)



Power Dissipation vs Output Current



Note 1: All data listed in the above graphs, except for derating data, has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.
Note 2: Thermal derating graphs are developed in free air convection cooling of 40-60 LFM. (See Thermal Application Notes.)